

Low Vcesat NPN Epitaxial Planar Transistor

BTC5706I3

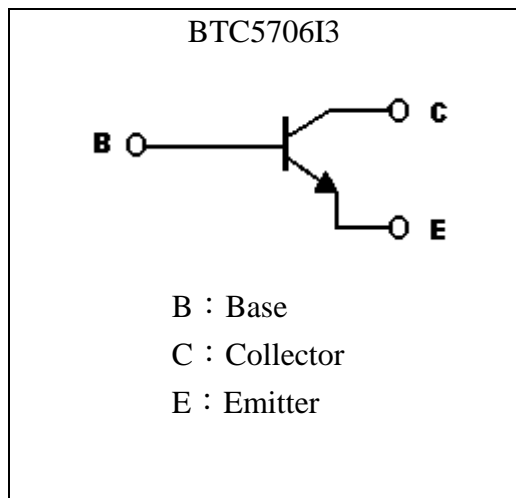
Features

- Low collector-to-emitter saturation voltage
- High-speed switching
- High allowable power dissipation
- Large current capability
- RoHS compliant package

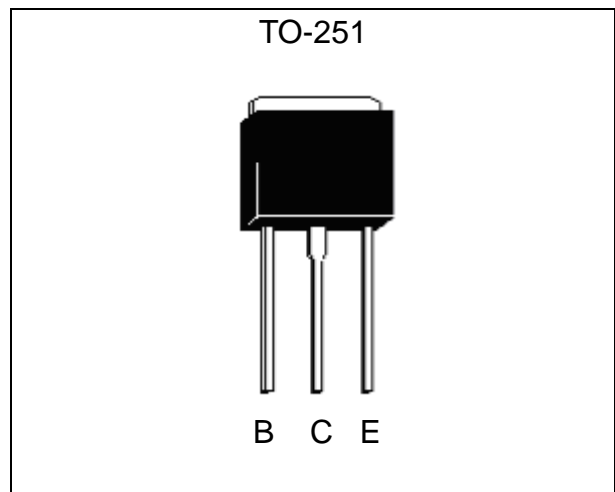
Applications

- DC-DC converter, relay drivers, lamp drivers, motor drivers, strobes.

Symbol

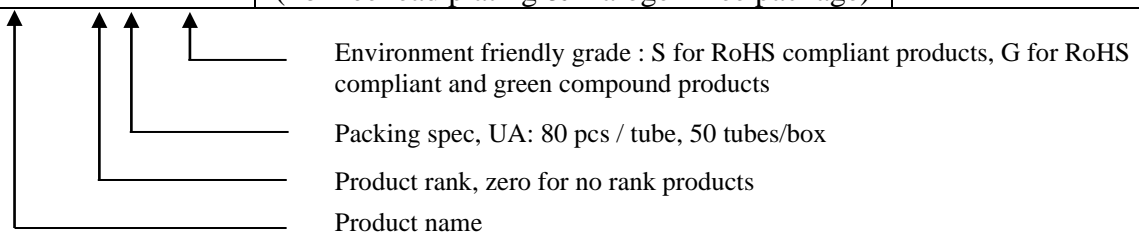


Outline



Ordering Information

Device	Package	Shipping
BTC5706I3-0-UA-G	TO-251 (Pb-free lead plating & Halogen-free package)	80 pcs/tube, 50 tubes/box





Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V _{CBO}	80	V
Collector-Emitter Voltage	V _{CES}	80	V
Collector-Emitter Voltage	V _{CEO}	60	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current (DC)	I _C	5	A
Collector Current (Pulse)	I _{CP}	7.5 (Note 1)	
Base Current	I _B	1.2	A
Power Dissipation @ T _A =25°C	P _D	0.8	W
Power Dissipation @ T _C =25°C	P _D	15	
Thermal Resistance, Junction to Ambient	R _{θJA}	156	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	8.33	°C/W
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55~+150	°C

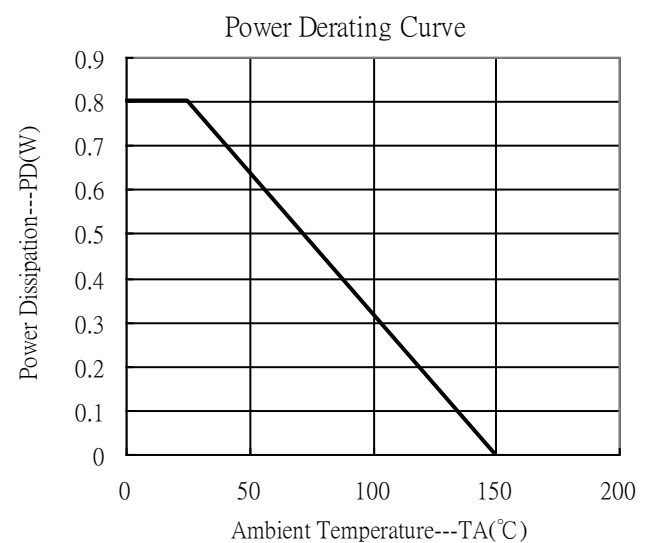
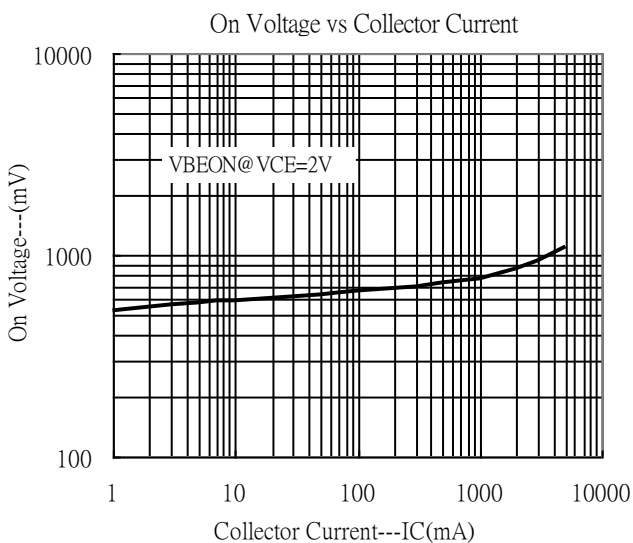
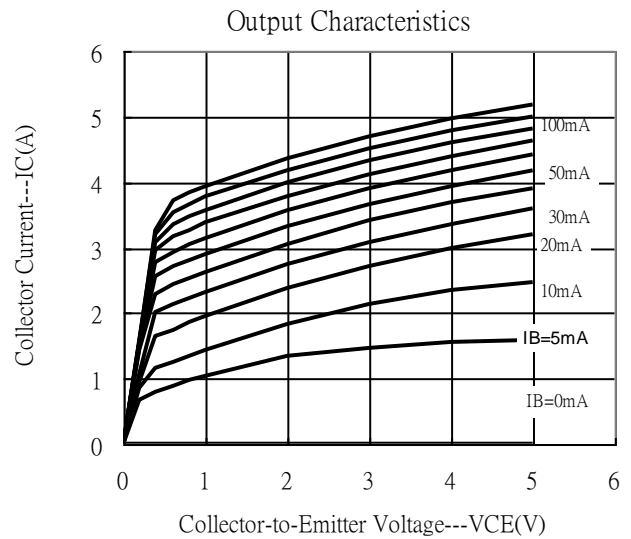
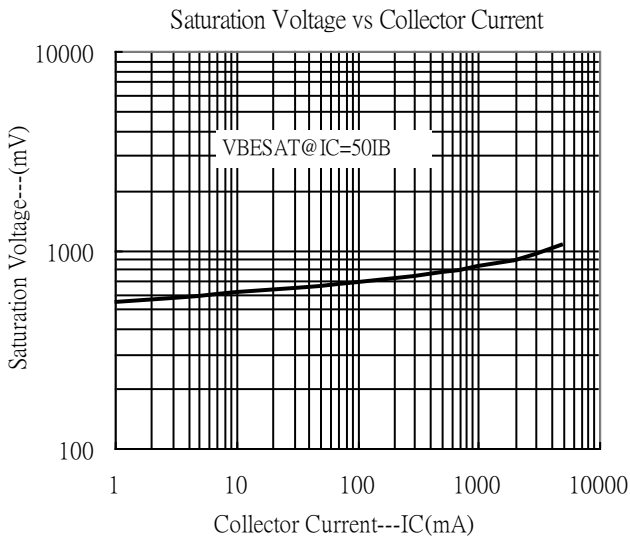
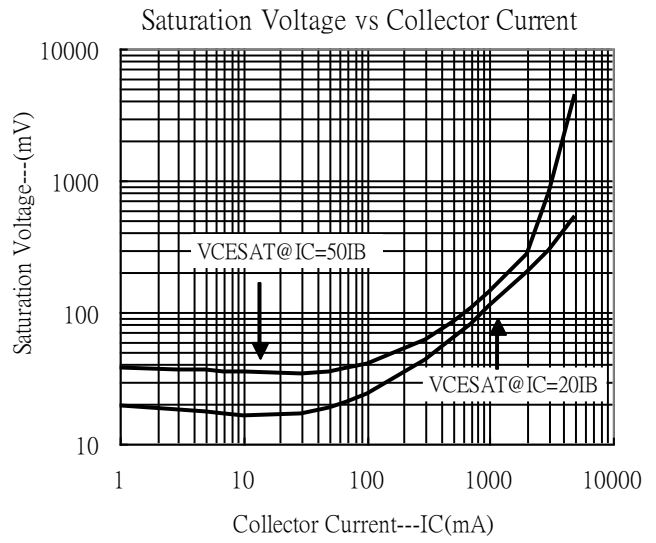
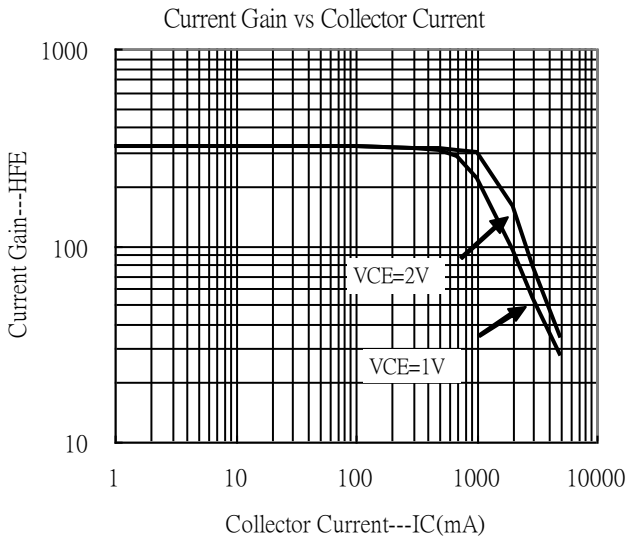
Note : 1. Single Pulse , Pw ≤ 380μs, Duty ≤ 2%.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	80	-	-	V	I _C =10μA, I _E =0
BV _{CES}	80	-	-	V	I _C =100μA, R _{BE} =0
*BV _{CEO}	60	-	-	V	I _C =1mA, I _B =0
BV _{EBO}	6	-	-	V	I _C =10μA, I _C =0
I _{CBO}	-	-	1	μA	V _{CB} =80V, I _E =0
I _{EBO}	-	-	1	μA	V _{EB} =4V, I _C =0
*V _{CE(sat)} 1	-	110	135	mV	I _C =1A, I _B =50mA
*V _{CE(sat)} 2	-	200	240	mV	I _C =2A, I _B =100mA
*V _{BE(sat)}	-	0.89	1.2	V	I _C =2A, I _B =100mA
*h _{FE}	200	-	560	-	V _{CE} =2V, I _C =500mA
f _T	-	400	-	MHz	V _{CE} =10V, I _C =500mA
C _{ob}	-	15	-	pF	V _{CB} =10V, f=1MHz
t _{on}	-	35	-	ns	V _{CC} =25V, I _C =10I _{B1} =-10I _{B2} =1A, R _L =25Ω
t _{stg}	-	300	-	ns	
t _f	-	20	-	ns	

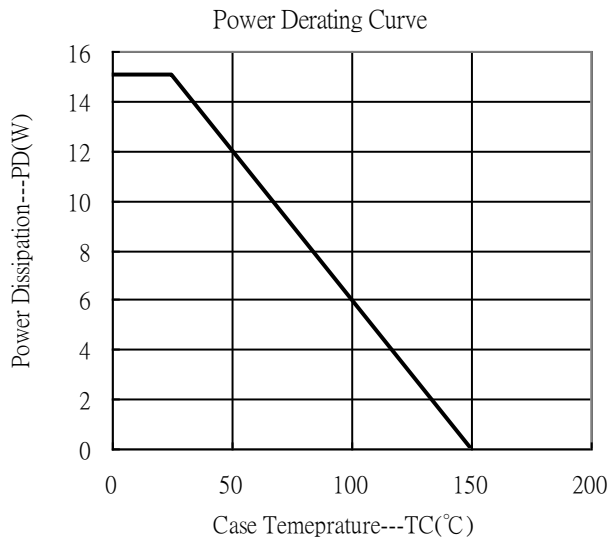
*Pulse Test : Pulse Width ≤ 380μs, Duty Cycle ≤ 2%

Characteristic Curves





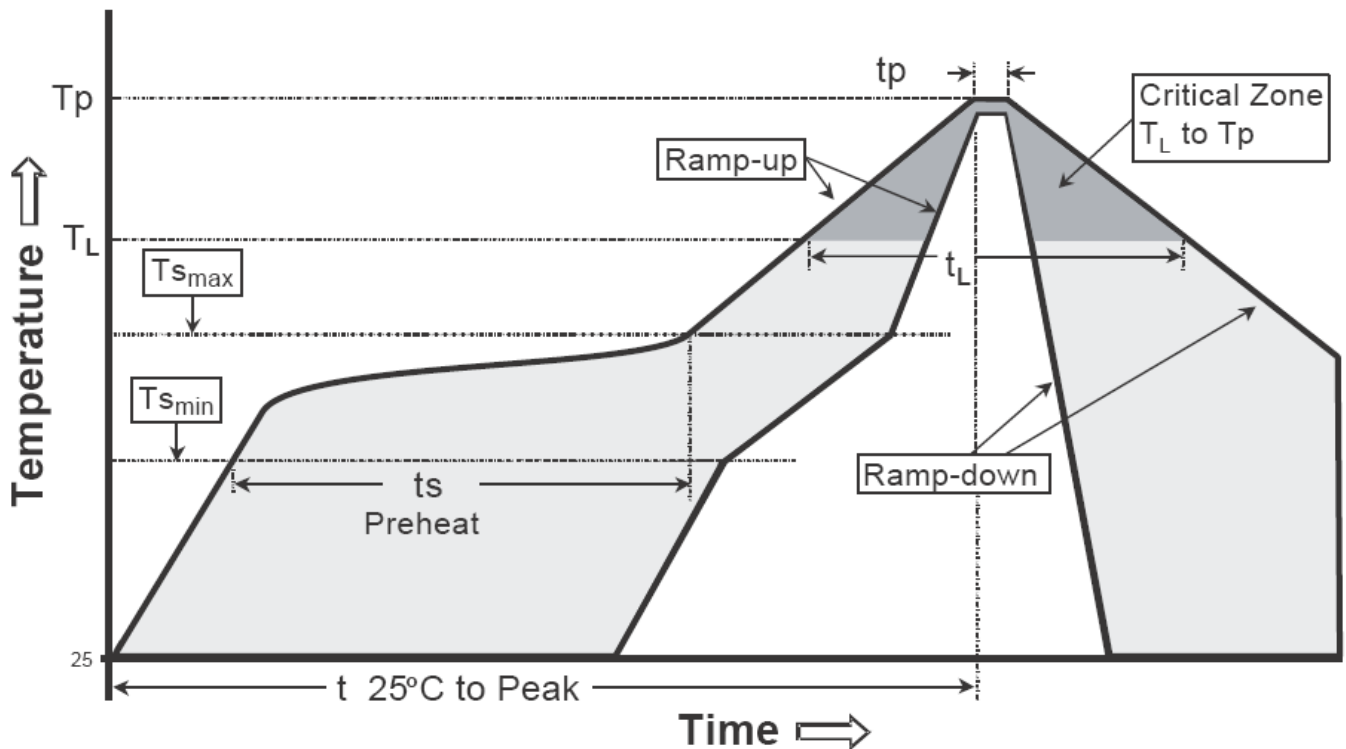
Characteristic Curves(Cont.)



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

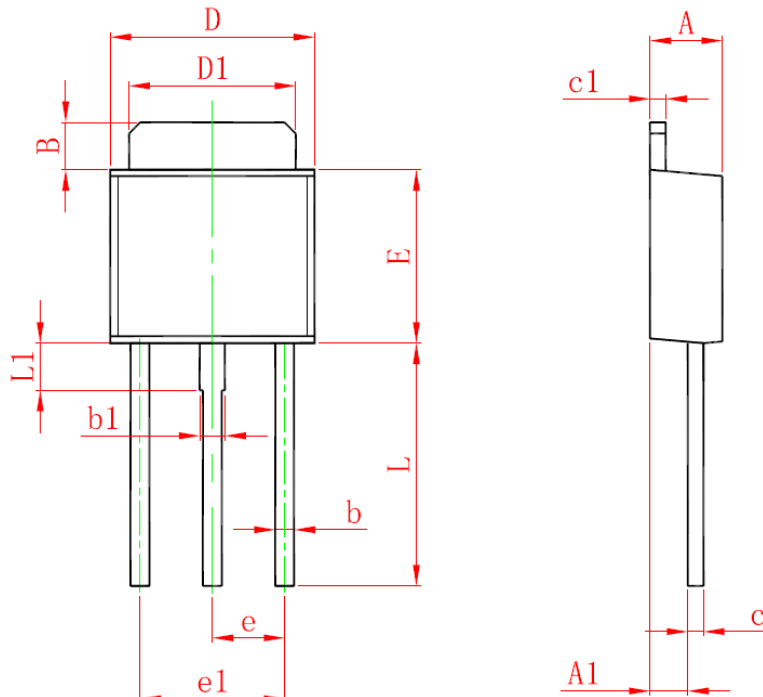
Recommended temperature profile for IR reflow



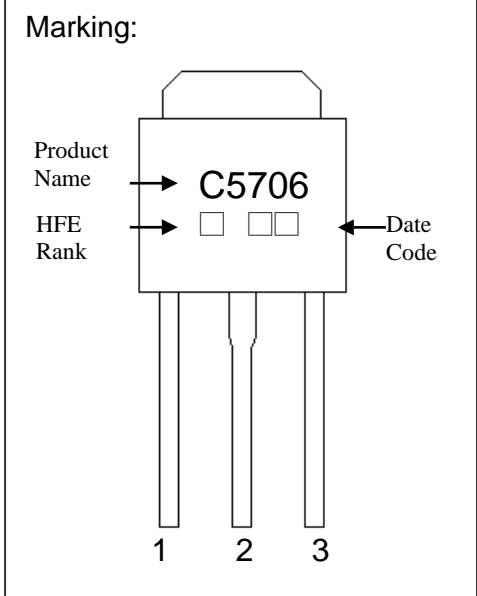
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	60-150 seconds
Peak Temperature(T _p)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(t _p)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

TO-251 Dimension



Marking:



3-Lead TO-251 Plastic Package
CYStek Package Code: I3

Style : Pin 1. Base 2. Collector 3. Emitter

Year Code:
 5→2015, 6→2016, ..., etc
 Month Code:
 1→Jan, 2→Feb, ..., 9→Sep, A→Oct, B→Nov, C→Dec

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094	D	6.350	6.650	0.250	0.262
A1	1.020	1.270	0.040	0.050	D1	5.200	5.400	0.205	0.213
B	1.350	1.650	0.053	0.065	E	5.400	5.700	0.213	0.224
b	0.500	0.700	0.020	0.028	e	2.300 TYP		0.091 TYP	
b1	0.700	0.900	0.028	0.035	e1	4.500	4.700	0.177	0.185
c	0.430	0.580	0.017	0.023	L	7.500	7.900	0.295	0.311
c1	0.430	0.580	0.017	0.023	L1	1.200	1.600	0.047	0.063

Notes: 1. Controlling dimension: millimeters.
 2. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 3. If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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